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RECENT LITERATURE.

Zirkel's New Text Book of Petrography.¹—Although entitled a 'Lehrbuch' the revision of Prof. Zirkel's well known Petrography has rather the character of a 'Handbuch.' The first of the three volumes proposed to complete the work contains an introduction to the study of rocks, a description of the methods made use of in this study, an account of the peculiarities of form presented by rock-forming minerals, a review of the characteristics of each of the most important of these, a discussion of rock structure and the causes of its variation, a statement of the method of occurrence of rock masses, a chapter in the physical properties of rocks and one on the changes which they undergo when subjected to external influences. Following these, which occupy in all 635 closely printed pages, there are some 190 pages in the mineral, chemical and structural relations of massive rocks, and a very full discussion of the theories proposed to explain the origin of the variations observed in rock masses, and in the different emanations from the same volcanic centre, which concludes with the scheme of classification for massive rocks that the author intends to follow in the succeeding volume.

As the synopsis of the contents shows Prof. Zirkel expects to cover the entire field of petrography in a way that has never been attempted hitherto. He will treat not only of the massive rocks, but of the sediments and crystalline schists as well. The first volume gives no evidence as to the fullness with which the individual rock types will be discussed, but it is quite certain that the three volumes will fill a place that has long been ready for them in the working room of every petrographer.

The special excellencies of the volume before us consist in the very complete bibliographies appended to or inserted within the paragraphs pertaining to different heads, the thoroughness with which the field has been covered by it, and the freshness of the material between its covers. Of course the second edition is not a revision of the author's first edition of the Lehrbuch. It is an entirely new book, rewritten from 'preface to finis.' And more than this—it contains references to the very latest petrographical researches published in this country as

¹Lehrbuch der Petrographie by Dr. Ferdinand Zirkel. 2te Aufl., Erster Band. Leipzig, Wilhelm Engelmann, 1893. Pp. x and 845.

well as in Europe. The faults of the book are such only when it is criticized as a Lehrbuch. As a manual it is very satisfactory, though one would wish that the author had made his list of rock-forming minerals more complete than it is, and had given more detailed instructions as to the manipulations in some of the investigation methods mentioned. Upon comparison with Rosenbusch's first volume it is found that this treats of forty-four more minerals than does Zirkel's book, but then the Heidelberg volume deals only with microscopical petrography. Further, the absence of illustrations from the Lehrbuch will prevent its use as a text book for students, and the failure to attempt an explanation of the action of mineral plates toward polarized light will in large measure keep it from even our universities and technical schools. But these faults, we repeat, are faults in a text book. They are not altogether weaknesses in a hand-book. Zirkel will become the reference book of petrographers, while Rosenbusch will remain their text book.

In that portion of the volume occupied with the special discussion of massive rocks, the author outlines his classification and gives his reasons for it. He declines to recognize the dyke rocks as a well established class, and so makes his division (according to structure and mineralogical composition) into granular and porphyritic groups, and then into types. In the first group, age distributions are disregarded. In the second group the old distinction between pre-tertiary and tertiary volcanics is revived. Petrography is regarded as primarily as a study of rock bodies, and secondarily as a branch of geology.

The lack of illustrations which has already been noted will not detract seriously from the value of the volume as a reference book, as the author has no new structures to define and no new rock-types to establish. He gives an excellent resumé of petrographical literature and there stops. He has no theories to advance and no attacks to his brother investigators, except now and then, a mild one upon Rosenbusch, and his discussions upon the literature are uncolored by his own views. Now and then a criticism is interjected into the discussion, but upon the whole the author allows the conclusions reached in the articles cited to stand unchallenged, or if they are challenged it is by the citation of other authors. In brief the Lehrbuch is an excellent resumé of our present knowledge of rocks and a fine reference book to petrographical literature. Naturally more interest will be felt in the two volumes to appear, than in the first volume, for at least one of these will afford a starting point for a systematic petrographical study of the crystalline schists.

W. S. B.